

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1-13. (Cancelled)

14. (New) An antenna apparatus, comprising:

a cavity having a cavity surface with an end portion;

a feeding point arranged at the end portion of the cavity surface;

a $\lambda/4$ linear element having a first end connected to the feeding point, and a second end separated from the first end by a physical length shorter than a one-quarter wavelength; and

a half-wave antenna element connected to the second end of the $\lambda/4$ linear element at a connecting point via a conductor piece having a conductor piece surface arranged separate from the cavity surface.

15. (New) The antenna apparatus according to claim 14, wherein the linear element includes a first portion extending in a first direction opposite to that of the half-wave element from the feeding point and a second portion extending in a second direction, which is equal to a direction in which the half-wave antenna element extends.

16. (New) The antenna apparatus according to claim 15, wherein the connecting point is located within a predetermined distance of the feeding point.

17. (New) The antenna apparatus according to claim 14, wherein the physical length of the linear element ranges from a one-sixth wavelength to a one-fifth wavelength.

18. (New) The antenna apparatus according to Claim 14, wherein the linear element is aligned with the half-wave element inside the conductor piece.

19. (New) The antenna apparatus according to claim 14, wherein a cross-section al area of the conductor piece is larger than that of the linear element.

20. (New) The antenna apparatus according to claim 14, wherein a lateral area of the conductor piece per unit length is larger than that of the linear element per unit area.

21. (New) The antenna apparatus according to claim 14, wherein the conductor piece is spherical.

22. (New) The antenna apparatus according to claim 14, wherein the conductor piece is shaped like a square-pole.

23. (New) The antenna apparatus according to claim 14, wherein the conductor piece is cylindrical.

24. (New) The antenna apparatus according to Claim 14, wherein the conductor piece comprises an internal dielectric coated with the conductor surface.

25. (New) The antenna apparatus according to claim 14, further comprising a dielectric inserted between the conductor piece and the cavity.

26. (New) An antenna apparatus, comprising:
a cavity having a cavity surface with an end portion;
a feeding point arranged at the end portion of the cavity surface;
a linear element having a first end connected to the feeding point, and a second end separated from the first end by a physical length shorter than a one-quarter wavelength, and being arranged so as not to be electrically connected to said cavity; and

a half-wave antenna element connected to the second end of the linear element at a connecting point via a conductor piece having a conductor piece surface arranged separate from the cavity surface.

27. (New) An antenna apparatus, comprising:
a cavity having a cavity surface with an end portion;

a feeding point arranged at the end portion of the cavity surface;

a linear element having a first end connected to the feeding point and a second end separated from the first end by a physical length shorter than a one-quarter wavelength, and being arranged so as to electrically separated from said cavity and a half-wave antenna element connected to the second end of the linear element at a connecting point via a conductor piece having a conductor piece surface arranged separated from the cavity surface.

28. (New) An antenna apparatus, comprising:

a cavity having a cavity surface with an end portion;

a feeding point having a ground terminal which is connected to the cavity surface and arranged at the end portion of the cavity surface;

a linear element having a first end connected to the feeding point, and a second end separated from the first end by a physical length shorter than a one-quarter wavelength; and

a half-wave antenna element connected to the second end of the linear element at a connecting point via a conductor piece having a conductor piece surface arranged separate from the cavity surface.